

PHILIPPINE AND ASIATIC PSYLLIDÆ

By D. L. CRAWFORD

(*Pomona College, Claremont, California*)

ONE PLATE

Since my last paper on Psyllidæ of the Orient¹ was written, several small collections have been received from Professor C. F. Baker, that most indefatigable collector. Another collection of considerable interest, from the Pusa Research Institute, includes specimens from various parts of India and Ceylon, accumulated by Mr. T. B. Fletcher. In the former collection are two new genera and several very interesting new species. In the latter collection there is only one new species, but the collection is a valuable one in that new distribution records are established for known species.

Pauropsylla brevicephala sp. nov. Plate I, fig. 11.

Length of body, 1.3 millimeters; length of forewing, 2.0; width, 0.9; width of head, 0.65. General color brown with orange or yellow markings on dorsum and pleurum of thorax; antennæ mostly light brown, apex black; wings hyaline with five black marginal spots, one at end of each of four furcal veins and of radius. Body medium to small, robust. Dorsum of head and thorax shagreened.

Head not as broad as thorax, very short, much deflexed so that it appears to be situated almost beneath the prothorax. Vertex much broader than long, uniformly rounded forward and downward, front ocellus beneath. Genæ scarcely swollen; labrum not very large. Antennæ very short, not as long as width of vertex between eyes.

Thorax strongly arched, broad. Legs short. Wings a little more than twice as long as broad, hyaline and very slightly fumate, rounded at apex, venation somewhat resembling that of *Paurocephala psylloptera*.

Abdomen short. Female genital segment small, short; dorsal valve with a rounded hirsute hump midway dorsad and the apex acute and curved upward; ventral valve very small and its apex turned downward.

MINDANAO, Davao (*Baker*), 2 females.

¹ *This Journal, Sec. D* (1915), 10, 257-269.

Homotoma bilineata sp. nov. Plate I, fig. 1.

Length of body, 2.3 millimeters; length of forewing, 2.9; width, 1.2; width of head, 0.67. General color black; forewings hyaline with two prominent black stripes joined at base and diverging in a V-shape.

Head short, as broad as thorax, deeply cleft in front, with eyes large and prominent; vertex about twice as broad as long, shining black and sparsely hairy; genæ very slightly swollen, but not wholly covering frons; antennæ not quite as long as body without wings, nearly four times as long as width of head, very thick and conspicuously hairy, with several very finely serrated carinæ on each segment; two basal segments large and thick.

Thorax not arched, relatively narrow and not robust, sparsely covered with long hairs. Legs moderately thick, but not very long. Forewings rhomboidal in shape, about two and a half times as long as broad, hyaline, with a black spot in clavus and a black stripe beginning at base of basal vein, dividing at junction point of cubitus and media into two stripes and the two extending and diverging toward apex of wing.

Abdomen long and slender. Male genital segment relatively small; forceps arched, about as long as anal valve, broadest subapically, and rounded at tip, somewhat hairy.

LUZON, Laguna, Mount Maquiling (*Baker*), 1 male.

In general aspects this species resembles *Homotoma pacifica* Crawford; but in the shorter antennæ, in wing shape, and in wing markings it is quite distinct.

Genus **CARSIDAROIDA** novum

Head much less deeply cleft in front than in *Carsidara*; vertex large, more or less quadrate, flattened; genæ covering frons and meeting vertex above antennal bases, with anterior ocellus at junction point and appearing to be in middle of vertex because of obscurity of suture between vertex and genæ; genæ swollen beneath antennal sockets, but without genal cones. Antennæ long and slender. Labium very long and slender and prominent.

Thorax not much arched, broad; pronotum long. Legs long and large; hind tibiæ with a spur at base and spines at apex. Forewings long, venation similar to that of species of *Carsidara*; with a callus (pseudovein) connecting medial and radial veins as in *Tenaphalara* and in *Carsidara*.

Type of genus: *Carsidaroida heterocephala* sp. nov.

Although this species differs from species of *Carsidara* in having the head less cleft in front, yet the position of the anterior

ocellus, the shape and the venation of the wing, the armed hind legs, the long labium, and the swollen genæ all point to a close affinity with the subfamily Carsidarinae and, especially, with the genus *Carsidara*.

Carsidaroida heterocephala sp. nov. Plate I, fig. 7.

Length of body, 2.6 millimeters; length of forewing, 4.8; width, 1.7; width of head, 0.8. General color brownish; thorax with alternating orange and brown or blackish stripes; head light brown or with a yellowish tinge; eyes black; abdomen darker than thorax. Body large.

Head not as broad as thorax, scarcely deflexed; vertex relatively small, more than half as long as broad, with a conspicuously raised margin extending between vertex and each eye and along posterior margin, but the posterior ocelli outside of this elevated rim; within the rim the vertex is rather flat, presenting the appearance of a saucer with perpendicular sides; front ocellus situated a little anterior of the center of this saucer, at obscure junction point of vertex and genæ. Genæ produced in front into a pair of very large, diverging, antennal sockets to the ends of which the antennæ attach, without genal cones except two exceedingly small ones far back under head just in front of labrum; antennal-socket enlargements of genæ very large and prominent beneath head, extending back toward labrum as a pair of parallel half-cylinders. Antennæ not quite as long as body without wings, nearly four times as long as width of head with eyes, slender, black at tip. Eyes relatively large. Labium very long.

Thorax large, not strongly arched; pronotum with a small epiphysis in front at center; legs long, rather large; hind tibiæ with a large spur at base and five large black spines at apex, one larger than the other four; other tibiæ with a fine comb of slender spines at apex. Forewings long, about three times as long as broad, hyaline with a faint smoky tinge, with several brown or black spots scattered about in apical portion; pterostigma rather large; with a callus (pseudovein) connecting radius and media and another connecting the radius and pterostigmal vein.

Abdomen very long and slender, tapering gradually to genital segment. Male genital segment rather small; anal valve with a broad, apically rounded erect portion and a horizontal prolongation, triangular in shape, reaching backward; forceps as long as anal valve, curved inward and forward, broadly rounded at apex; with a second and smaller pair of forceps cephalad of principal

pair. Female genital segment about one third as long as rest of abdomen, acutely pointed at apex, dorsal valve a little longer than ventral.

LUZON, Benguet, Baguio (*Baker*), 1 male and 1 female.

Rhinopsylla distincta sp. nov. Plate I, fig. 6.

Length of body, 2.9 millimeters; length of forewing, 4.8; width, 1.8; width of head, 0.7. General color light reddish brown to brown; eyes dark; parts of dorsum reddish; antennæ brown.

Head nearly as broad as thorax, scarcely deflexed, deeply cleft in front, covered sparsely with long hairs; posterior ocelli conspicuously elevated. Genæ swollen beneath into a pair of blunt processes (genal cones) projecting vertically downward and situated far back under the head near labrum. In some of the other species of this genus the genæ are swollen, but not into conical processes as in this species. Antennæ very slender, four times as long as width of head, large at base.

Thorax not broad, scarcely arched; pronotum short and much depressed below level of head and mesonotum; legs long, rather slender, hairy; hind tibiæ with a spur at base. Forewings very long, reaching more than half their length beyond abdomen, hyaline, acute at apex; first marginal cell larger than second.

Abdomen slender, rather small. Female genital segment about as long as rest of abdomen, both valves tapering to an acute end, the dorsal valve a little longer than ventral, sparsely hairy.

LUZON, Benguet, Baguio (*Baker*), 1 female.

Genus **STROGYLOCEPHALA** novum

Head short, not deflexed, very uniformly rounded in front, the eyes and vertex together forming almost a hemisphere; ocelli not elevated; frons not wholly covered by genæ, visible as a small sclerite between genæ with front ocellus at its apex; genæ not swollen into cones; labrum small; labium short. Antennæ short, a little longer than width of head. Thorax not arched; pronotum relatively long and with præscutum forming somewhat of a "neck." Legs short and not large. Forewings slender, acute at apex, with pterostigma.

Type of genus: *Strogylocephala fascipennis* sp. nov.

This genus is a member of the subfamily Pauropsyllinæ resembling *Pauropsylla* in some head characters, as the visible frons and rounded vertex, but differing from most others of this subfamily in the unarched thorax and slender wings. In the latter characters there is some resemblance to the Carsidarinae. The aspect of the type species is suggestive of *Tenaphalara*.

***Strogylocephala fascipennis* sp. nov.** Plate I, fig. 12.

Length of body, 1.3 millimeters; length of forewing, 1.8; width, 0.55; width of head, 0.4. General color dark brown or reddish; abdomen light brown; legs and antennæ yellow, the latter black at tip; wings with a brown band along posterior margin. Body small, slender.

Head almost hemispherical, not deflexed; vertex roundly convex, without depressions, finely punctate, posterior ocelli not elevated. Frons a narrow sclerite about one half to one third as broad as long. Genæ not at all swollen, except at attachment of antennæ and there only a little swollen, covering basal portion of frons. Antennæ about one half longer than width of head, slender, with rather long, terminal setæ.

Thorax scarcely elevated, not broad. Legs short, not armed. Forewings nearly three times as long as broad, very slender, acutely pointed, with first marginal cell very small; a broken and irregular brown band extends along posterior margin from base to apex, usually with a break about midway.

Abdomen slender. Male genital segment small; forceps short, small, almost as long as anal valve, inner surface toothed, pointed at apex, outer surface arcuate; anal valve small, erect, simple. Female genital segment small and short; dorsal valve rounded apically with a sharp, pointed prolongation at end; ventral valve shorter, more acute at apex.

LUZON, Laguna, Los Baños (*Baker*), 2 males and 1 female.

***Epipsylla forcipata* sp. nov.** Plate I, fig. 2.

Length of body, 2.8 millimeters; length of forewing, 3.4; width, 1.3; width of head, 0.84. General color light orange to lemon yellow; eyes and tips of antennæ black. Body a little larger than that of *Epipsylla pulchra* and lighter colored, without the conspicuous notal stripes of the latter.

Head not quite as broad as thorax, somewhat deflexed; vertex about three fourths as long as broad between eyes, with two large, shallow depressions between ocelli; front ocellus visible from above. Genal cones very long and slender, about one third longer than vertex, very little or not at all divergent, subacute. Antennæ about as long as body without wings, seldom longer, slender.

Thorax not strongly arched, broad; pronotum long, flat. Hind tibiæ with small spur at base and four back spines at apex. Wings hyaline, with an orange tinge, acutely rounded at apex, about two and one-half times as long as broad, pterostigma present.

Abdomen moderately long, not large. Male anal valve a little broader than forceps, truncate at apex with a slender prolongation reaching upward and backward toward forceps. Forceps as long as anal valve, stout, arched, with a row of about six black spines at apex and about six or seven on inner surface near apex pointing backward and interlocking with the corresponding spines of the opposite side; these are apparently a great aid in holding the female genital segment during copulation. Female genital segment nearly as long as the remainder of abdomen, tapering to the subacute apex; dorsal valve a little longer than ventral.

PALAWAN, Puerto Princesa (*Baker*), 3 males and 5 females.

Epipsylla pulchra Crawford.²

The female genital segment, not described in the original description of the species, is very similar to that of *E. forcipata*.

LUZON, Benguet, Baguio (*Baker*), 3 males and 2 females.

Euphalerus citri (Kuwayama).

Euphalerus citri (KUWAYAMA), CRAWFORD, Rec. Ind. Mus. (1912), 7, 424, Pl. 35, fig. D.

This is a widely distributed species throughout the Orient, from India through China to the Philippines. Additional specimens are before me now showing some slight variations from the typical forms in wing coloration—as might well be expected in such a widely distributed species—collected at Coimbatore, South India, by “T. V. R.” on *Cardia*, August 4, 1913; others from the same locality on August 22, 1913, collected by “C. N.” on *Cardia cardata*; others collected at Poona, Bombay, by T. B. Fletcher, Sept. 8, 1911.

Arytaina variabilis sp. nov. Plate I, fig. 3.

Length of body, 2.1 millimeters; length of forewing, 2.4; width, 1.3; width of head, 0.85. General color greenish yellow; eyes black; wings darker, with a brown apical and anterior, marginal band sometimes with darker spots scattered through the band. Body very robust, surface covered with stiff pubescence.

Head nearly or quite as broad as thorax, rather strongly deflexed. Vertex a little more than half as long as broad, surface irregular, with a transverse depression between posterior ocelli and from there roundly convex and sloping downward toward front ocellus; posterior ocelli scarcely elevated; anterior ocellus

² *This Journal*, Sec. D (1913), 8, 297.

easily visible from above. Genal cones large and broad, not divergent, rounded at apex, continuing in same plane with vertex, but separated therefrom by a deep furrow, about as long as breadth at base, with short stiff pubescence. Antennæ about as long as body without wings, very slender.

Thorax broad and robust, hairy. Legs short and stout; hind tibiæ with spur at base. Forewings broad, scarcely twice as long as broad, membrane scarcely hyaline, apex broadly rounded or a little angulate, veins setose; a darker band, often with black spots scattered through it, extends from first cubital vein around apex of wing to base of pterostigma; central portion light brown; second marginal cell differing in shape among individuals of the species.

Abdomen relatively short and thick. Male genital segment moderately large; forceps large, broad, spatulate, very broad at apex, apical margin rounded, broadly and finely toothed; anal valve longer than forceps, tapering to a small end. Female genital segment not as long as rest of abdomen, much smaller, tapering to acute end, dorsal valve a little longer than ventral.

MINDANAO, Butuan (*Baker*), 1 male; Davao (*Baker*), 1 male: LUZON, Tayabas, Malinao (*Baker*), 1 female. A fourth specimen, a female, from Mount Banahao, Laguna, Luzon (*Baker*), shows the venational characteristics of the Butuan male, but is destitute of the wing coloration present in all the other specimens. Whether this is a constant variation—a subspecies—or a chance individual not wholly developed is impossible to judge from the one specimen at hand. It appears that in this species there is a considerable variation in wing color and body color and in minor venational characters.

Arytaina tuberculata sp. nov. Plate I, fig. 8.

Length of body, 3.8 millimeters; length of forewing, 3.5; width, 1.8; width of head, 1.0. General color orange to tawny brown; eyes black; abdomen dark brown; antennæ dark over apical half; wings brownish. Body large, robust, surface covered with short, stiff pubescence.

Head nearly as broad as thorax, large, strongly deflexed. Vertex large, about half as long as breadth between eyes, each half roughly triangular in shape with the two discal depressions meeting at midline and forming one larger cavity, with a prominent wartlike tubercle on each side between posterior ocellus and antennal base; posterior ocelli elevated; anterior ocellus in notched front margin of vertex. Genal cones large, as long

as or slightly longer than basal width, extending forward in same plane with vertex, but separated therefrom by a deep furrow; broadly rounded at apex, a little divergent, hairy. Antennæ nearly as long as body without wings.

Thorax broad and large, strongly arched, hairy. Pronotum long. Legs large and stout; hind tibiæ with a prominent spur at base and the apical spines large. Forewings broad, about half as wide as long, light brownish and partially transparent, rounded broadly at apex; veins not setigerous.

Abdomen large, short. Female genital segment not as long as rest of abdomen, much smaller, acute at apex, dorsal valve a little longer than ventral.

MINDANAO, Davao (*Baker*), 1 female.

Arytaina punctipennis Crawford.

Psyllopa punctipennis CRAWFORD, Rec. Ind. Mus. (1912), 7, 431. Pl. 34, figs. K, O, Pl. 35, fig. U.

This interesting species was described originally as a *Psyllopa*, but this genus has subsequently been merged by the author with the older genus *Arytaina*. This species is a pest of indigo in the Orient and probably is the same as Buckton's *Psylla isitis*, but this identity has not been fully established. Several specimens are before me from Peradeniya, Ceylon, collected by T. B. Fletcher on *Indigofera*, April 14-17, 1914.

Psylla colorada sp. nov. Plate I, fig. 13.

Length of body, 1.6 millimeters; length of forewing, 2.1; width, 0.87; width of head, 0.55. General color bright red throughout, except antennal tips and eyes brown or black.

Head about as broad as thorax, well deflexed. Vertex about half as long as broad; posterior ocelli elevated on small pedicels; genal cones a little longer than vertex, strongly divergent, narrowly rounded at apex, sparsely clothed with long hairs. Antennæ scarcely two and one-half times as long as width of head, slender.

Thorax strongly arched. Legs small. Forewings hyaline, veins reddish, membrane uncolored; pterostigma rather large. Abdomen short. Male genital segment short, small; forceps spatulate, truncate, somewhat toothed at apex, arched; anal valve a little longer than forceps, long and narrow in profile, tapering to apex.

LUZON, Laguna, Mount Maquiling (*Baker*), 5 males.

This species resembles somewhat *Psylla coccinea* Kuwayama,

of Japan, but differs in head characters of some importance as well as in coloration, although both species are bright red in general color.

Psylla crenata sp. nov. Plate I, fig. 9.

Length of body, 3.0 millimeters; length of forewing, 3.6; width, 1.5; width of head, 1.1. General color dark brown, with light brown patches on vertex and both thoracic and abdominal dorsum; wings with yellowish tinge and a prominent dark band on apical margin. Body large and very robust.

Head large and broad, but not quite as broad as thorax, strongly deflexed. Vertex about half as long as broad, each half strongly triangular, converging toward front ocellus, posterior ocelli large and somewhat elevated; between each posterior ocellus and antennal base is a wartlike prominence. Genæ very large, prominent around antennal bases and conspicuous between vertex and eyes; genal cones large, as long as vertex, a little divergent, subacute at apex, pubescent. Antennæ very long and slender, fully as long as entire body to tip of wings or about four times as long as width of head.

Thorax very broad and large, strongly arched; pronotum sinuate or crenate on dorsal surface, with three rounded convexities. Legs large, hairy; hind tibiæ with a prominent spur at base. Forewings large, broad, broadly rounded at apex, with a broad brown or black band with indefinite margin extending around apex of wing from tip of claval suture to middle of radial cell; membrane of wing fumate or light brown.

Abdomen very large. Female genital segment large, as long as or longer than rest of abdomen, converging to acute apex, dorsal valve longer than ventral.

MINDANAO, Butuan (*Baker*), 1 female.

Trioza eugenioides sp. nov.

Length of body, 1.9 millimeters; length of forewing, 3.8; width, 1.4; width of head, 0.7. General color brown to dark brown, with lighter tawny stripes along dorsum and patches of the same color on pleura and abdomen.

MINDANAO, Butuan (*Baker*), 3 females; no data on food habits given.

The general appearance and structure are similar to *Trioza eugeniæ* Crawford³ and *Trioza asiatica* Crawford,³ but the

³ *This Journal*, Sec. D (1915), 10, 265, Pl. I, fig. e, 266.

species differs from both in color, wing venation, and a few other characters. These differences may be summarized as follows:

1. Thorax smooth, shining, black; wings very narrow, about three times as long as broad; second marginal cell about twice as long as greatest width; fourth furcal ($M_1 + 2$) terminating in wing apex; male anal valve almost quadrate; genal cones about one third as long as vertex.

Trioza asiatica Crawf.

2. Thorax punctate or rugulose, not smooth; light green or yellowish green; wings about three times as long as broad; second marginal cell about two and one-half times as long as greatest width; fourth furcal ($M_1 + 2$), extending to apex or near it. Male anal valve triangular. Genal cones half as long as vertex.

Trioza eugeniae Crawf.

3. Thorax punctate and brown with light stripes and blotches; wings about two and three-fourths times as long as broad; second marginal cell only a little longer than greatest width; fourth furcal ($M_1 + 2$) terminating in front of apex with apex within second marginal cell. Genal cones strongly decurrent, fully one half as long as vertex or more.

Trioza eugenioides sp. nov.

All three of these species are probably gall-forming, as mentioned in the paper cited in the footnote. One very large female in the collection, from Mount Banahao, Luzon (*Baker*), seems to belong to a fourth species of this group, but I am deferring its description until more specimens appear.

Trioza divisa sp. nov. Plate I, fig. 5.

Length of body, 2.1 millimeters; length of forewing, 3.7; width, 1.5; width of head, 0.8. One half black and one half light; head, thorax, base of abdomen, and legs dark brown or black; caudal half of abdomen white; basal third of wings black, remainder hyaline, the hyaline portion beginning at the white portion of abdomen, thus dividing insect into anterior dark half and posterior light half. Body robust; surface covered with long slender hairs.

Head strongly deflexed, not as broad as thorax. Vertex distinctly longer than half its width, somewhat irregularly convex, sparsely covered with long hairs, posterior ocelli not elevated. Genal cones nearly as long as vertex, extending nearly parallel to plane of vertex but below it. Eyes large. Antennæ about one and one-half times as long as width of head, whitish except black at tip, with several very long hairs on each segment.

Thorax robust, broad, large, arched; pronotum short and depressed. Legs hairy, rather stout; hind tibiæ with small spur at base and three thick spines at apex. Forewings about two and

one-half times as long as broad, black and opaque on basal third, hyaline or slightly fumate on remainder; veins with very long hairs; with a tendency toward a cubital petiole, but otherwise not related to *Ceropsylla*.

Abdomen (of male) very short. Male genital segment small and whitish or yellow; anal valve small, hood-shaped, profile narrow and longer than forceps, subacute at apex; forceps relatively broad, arched, apex truncate.

LUZON, Benguet, Baguio (*Baker*), 2 males.

Trioza luzonensis sp. nov. Plate I, fig. 10.

Length of body, 2.3 millimeters; length of forewing, 3.2; width, 1.3; width of head, 0.75. General color light orange to reddish or to yellowish; apical third of antennæ black. Body surface sparsely hairy.

Head not much deflexed; vertex fully half as long as broad, with a prominent elevation at each posterior ocellus and a prominent convexity on each side of median line, with a deep sulcus between each ocellus and medial convexity. Genal cones small, scarcely half as long as vertex, divergent, rounded or subacute, well below plane of vertex. Antennæ a little more than twice as long as width of head.

Thorax well arched. Legs somewhat hairy. Forewings hyaline, with setigerous veins. Male genital segment moderately large; anal valve large, triangular in profile, with posterior angle acute; forceps about as long as anal valve, slender, arched, acute at apex. Female genital segment less than half as long as rest of abdomen, both valves acute and about equal in length.

LUZON, Laguna, Mount Maquiling (*Baker*), 1 male and 4 females; Benguet, Baguio (*Baker*), 1 male.

Trioza fletcheri Crawford.

Trioza fletcheri CRAWFORD, Rec. Ind. Mus. (1912), 7, 434, Pl. 34, fig. V, Pl. 35, fig. Q.

Two imperfect specimens from Coimbatore, South India, seem to belong to this species, though it is impossible to make any conclusive statement because of the poor condition of the specimens. They were collected by "Y. R." in galls of *Trewia* sp., December 9, 1913.

Trioza jambolanæ sp. nov. Plate I, fig. 4.

Length of body, 2.0 millimeters; length of forewing, 3.5; width, 1.4; width of head, 0.8. General color reddish brown, abdomen

darker; antennæ and legs a little lighter brown; antennæ black at tip.

Head not quite as broad as thorax, deflexed. Vertex about half as long as broad, with a deep furrow down median line and a convexity on each side and a deep furrow on each side of these convexities and the much elevated posterior ocelli. Genal cones as long as vertex, divergent, somewhat decurrent, hairy, sub-acute. Antennæ about one and one-half times as long as width of head, slender.

Thorax well arched, broad; pronotum short, depressed. Forewings about two and one-half times as long as broad, hyaline, with a black spot in middle of clavus, rather acute at apex.

Abdomen large. Female genital segment very short, dorsal valve longer than ventral, both acute.

BENGAL, Pusa (*C. S. Misra*), 2 females, on *Eugenia jambolana*, Feb. 3, 1915.

Type specimen deposited in British Museum, London.

ILLUSTRATIONS

PLATE I. FOREWINGS OF NEW PSYLLIDÆ

- FIG. 1. *Homotoma bilineata* sp. nov.
2. *Epipsylla forcipata* sp. nov.
3. *Arytaina variabilis* sp. nov.
4. *Trioza jambolanæ* sp. nov.
5. *Trioza divisa* sp. nov.
6. *Rhinopsylla distincta* sp. nov.
7. *Carsidaroida heterocephala* g. et sp. nov.
8. *Arytaina tuberculata* sp. nov.
9. *Psylla crenata* sp. nov.
10. *Trioza luzonensis* sp. nov.
11. *Pauropsylla brevicephala* sp. nov.
12. *Strogylocephala fascipennis* g. et sp. nov.
13. *Psylla colorada* sp. nov.